MITSUBISHI
ELECTRIC

DLP™ Projector

UD8900U/UD8850U

Controlling the projector via RS-232C connection

Contents

1. Introduction

This projector can be controlled by connecting a personal computer with RS-232C terminal.
In addition, by connecting multiple projectors to each other in a daisy chain configuration, you can control each projector from one personal computer.

PC-controllable functions:

- Turning the power ON or OFF
- Changing input signals
- Inputting commands by pressing the buttons on the control panel and remote control
- Menu setting

[Compatibility with the former models]

To use the RS-232C commands designed for the former models of Mitsubishi projector, by inputting "00COMMAND0", the projector responds in the same way as the former models. (No NAK is returned. For NAK response, see page 4. ID code cannot be designated at command sending.)
(For the recommended procedure to use the former command systems, see "Controlling the projector using a personal computer" for FL7000U.)

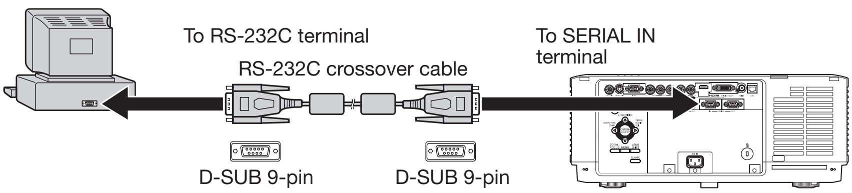
ITEM	Function		Data
	Character	ASCII code	
Changing the RS-232C command system	COMMAND	43h 4Fh 4Dh 4Dh 41h 4Eh 44h	0 (Former command system), 1 (New command system)

1.1 Connection

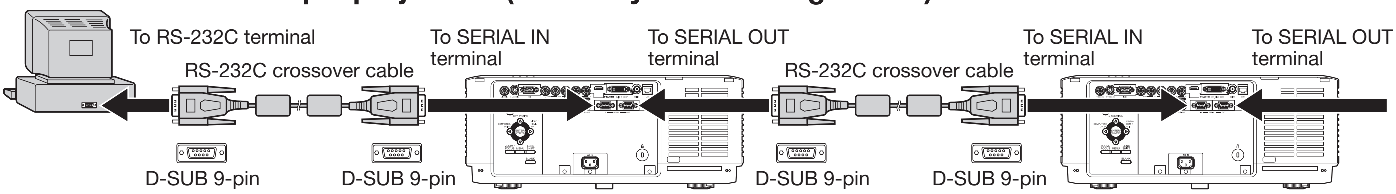
Important:

- Make sure that your computer and projector are turned off before connection.
- Boot up the computer first, and then plug the power cord of the projector.
  (If you do not follow this instruction, the COM port may not function.)
- To use a daisy chain configuration, make sure to use Mitsubishi projectors supporting RS-232C communication. If the projectors or other devices made by other manufacturers are connected, operation is not guaranteed.

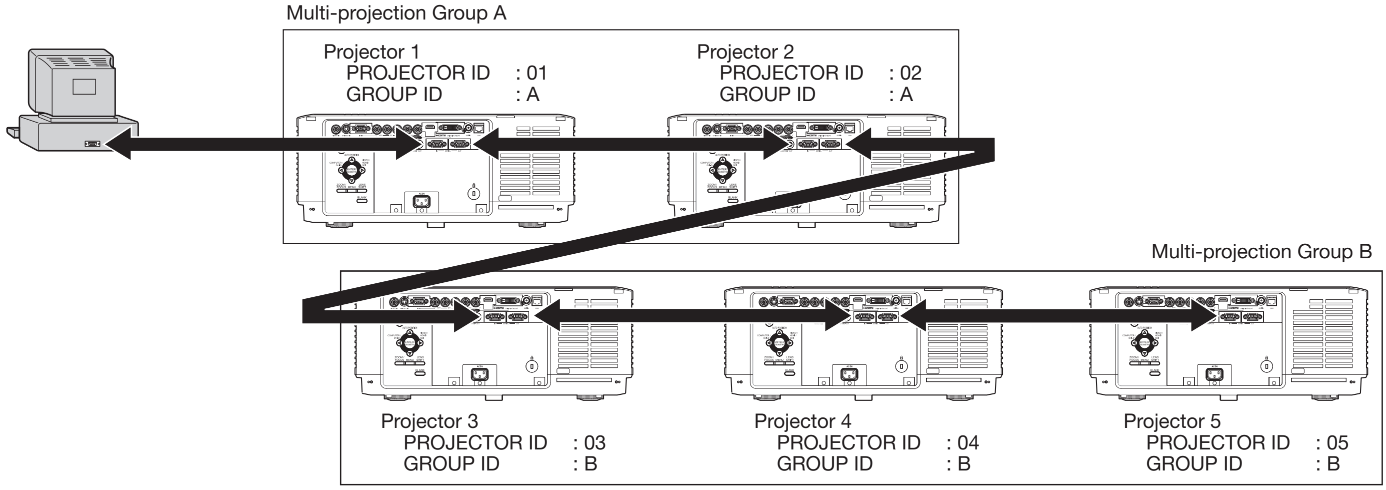
To connect with one projector:



To connect with multiple projectors (in a daisy chain configuration):



- Example of ID setting (When Group A, which performs multi-projection with two projectors, and Group B, which performs multi-projection with three projectors, are connected.)



You can assign the ID code to the control command.

- When the command having the PROJECTOR ID is sent, only the projector having the corresponding ID returns the response.
  (When the PROJECTOR ID is set to ALL on the projector, the projector responds to all the PROJECTOR ID numbers assigned to the commands.)
- When the command having the GROUP ID is sent, all the projectors having the corresponding ID return the response.
- When the command having no ID code is sent, all the projectors return response.

When the projectors are connected in a daisy chain configuration, you are recommended to set the PROJECTOR ID to other than “ALL” and assign the PROJECTOR ID differently for each projector to communicate with each projector individually. Refer to the operation manual of the projector for setting the PROJECTOR ID.
When you use a daisy chain configuration, set the STANDBY MODE to “STANDARD.” Refer to the operation manual of the projector for setting the STANDBY MODE.

Important:

- Adapters may be necessary depending on the PC connected to this projector. Contact your dealer for details.

1.2 Interface

1.2.1 Pin assignment of SERIAL IN and SERIAL OUT terminals (D-SUB 9-pin)

Pin No.	Name	I/O
1	OPEN	
2	RXD	IN
3	TXD	OUT
4	OPEN	
5	GND	
6	OPEN	
7	OPEN	
8	OPEN	
9	OPEN	

1.2.2 Communications format

PROTOCOL	RS-232C
BAUD RATE	9600 [bps]
DATA LENGTH	8 [bits]
PARITY BIT	NONE
STOP BIT	1 [bit]
FLOW CONTROL	NONE

This projector uses RXD, TXD and GND lines for RS-232C control.
For RS-232C cable, the supplied cable (crossover cable) should be used.

2. Control command configuration

The command consists of the address code, ID code, function code, data code, ACK/NAK, and end code. The length of the command varies among the functions.

	Address code	ID code	Function code	Data code	ACK/NAK	End code
ASCII code	'30h' '30h'	'3Bh' ID '3Bh'	Function	Data	'3Ah' '4Eh'	'0Dh'
Character	00	;ID;	Function	Data	:N	↵

[Address code] Fixed to 00. ('30h' '30h' in the ASCII code)

[ID code] Code specifying the projector to be controlled (For ID, specify either the PROJETOR ID (00 to 63) or GROUP ID (0A to 0Z). When the code is not specified, all the connected projectors are controlled.)

[Function code] Code unique to each control operation.

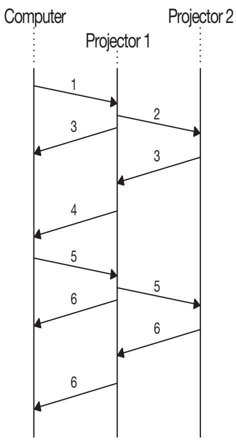
[Data code] Data (value) unique to each control operation (Not always indicated.)

[ACK/NAK] Code indicating the NAK return as described below
Fixed to :N ('3Ah' '4Eh' in the ASCII code. Not added to ACK.)

[End code] Fixed to ↵. ('0Dh' in the ASCII cade)

3. Control sequence

[Example] When the personal computer and two projectors are daisy-chained:



	Sequence	Note
1	Send the command from the personal computer to the projector.	
2	The command input from the SERIAL IN terminal is sent to the projector connected to the SERIAL OUT terminal.	
3	After receiving the end code, the projector sends the return command to the device connected to the SERIAL IN terminal.	If the projector does not receive commands normally, that is, if the projector is not connected physically or unable to receive commands, it does not send out a return command. In addition, when the ID code of the command is not corresponded to that of the projector, the projector doesn't send a return command. The projector sends out a return command within one second at the latest. When the received command cannot be executed, NAK is returned (as described below).
4	The return command input from the SERIAL OUT terminal is sent to the device connected to the SERIAL IN terminal.	The personal computer receives the commands as many as the number of the projectors that send the returned commands. However, **the receiving order of the returned commands may vary depending on the projector status.**
5	The personal computer checks the command and confirms if the sent command has been received or not.	
6	Use the check command to see if the projector has executed the command.	This projector sends various codes other than the return code. When having a control sequence by RS-232C, reject other codes from the personal computer.

- NAK return
  In the following cases, the projector returns the command with ":N" added.
  (1) Though the command sent from the computer is received by the projector successfully, it cannot be executed because the projector is in the operation prohibition state.
  (2) The data length of the sent command is incorrect or the command is invalid.
  (3) The ID assigned to the command is out of the valid range (other than 00 to 63 or 0A to 0Z).
  (4) The signal length of the command is 48 bytes or longer.
- When a command is sent out during the following operations, it may not be executed.
  (1) During signal switching
  (2) In the process of the auto position
  (3) After the power is turned on.
  After the power is turned on, no command is received until the image is displayed. (Usually, it takes about 20 seconds. However, when the lamp illumination takes time, more time will be required accordingly.) In this case, the projector returns the received command with NAK added.
- The return command is sent out within 1 second at the latest.
- **When sending commands successively, wait to receive the return command of the current command before sending a next command.**

- The projector may not receive a command when the splash screen is being displayed immediately after turning on the power. Use command “00r10” to cancel the splash screen.
- While using the LAN terminals, the LAN functions take precedence.
- For the LAN terminals, the same commands as those for connecting with the TCP/IP (port number 63007) are available. Note, however, that the response becomes slightly slower than when using the RS-232C terminals. For the use of LAN terminals, refer to “4. Execution procedure of RS-232C commands via LAN”.
- When the NAK isn’t returned, check the RS-232C command system (00COMMAND).

[Example 1] Turning ON the power. (Values enclosed in quotation marks are ASCII codes.):

- When ID is not specified:

Command sent from the PC	Status code returned from the projector	Description
‘30’ ‘30’ ‘21’ ‘0D’ 00!↵		Command for POWER ON (ID command is omitted.)
	‘30’ ‘30’ ‘21’ ‘0D’ 00!↵	Command receipt confirmation (The statuses are echoed back as many as the number of the connected projectors.)

- When ID is specified (when the command is sent to the projector with the ID of “01” or “ALL”):

Command sent from the PC	Status code returned from the projector	Description
‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘21’ ‘0D’ 00;01;!↵		Command for POWER ON is sent to the projector with the ID of “01” or “ALL.”
	‘30’ ‘ 30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘21’ ‘0D’ 00;01;!↵	The projector with the ID of “01” or “ALL” receives the command. (The status is echoed back from the projector with the ID of “01” or “ALL.”)

[Example 2] Selecting VIDEO as the input signal during auto positioning (Values enclosed in quotation marks are ASCII codes.):

- When ID is not specified:

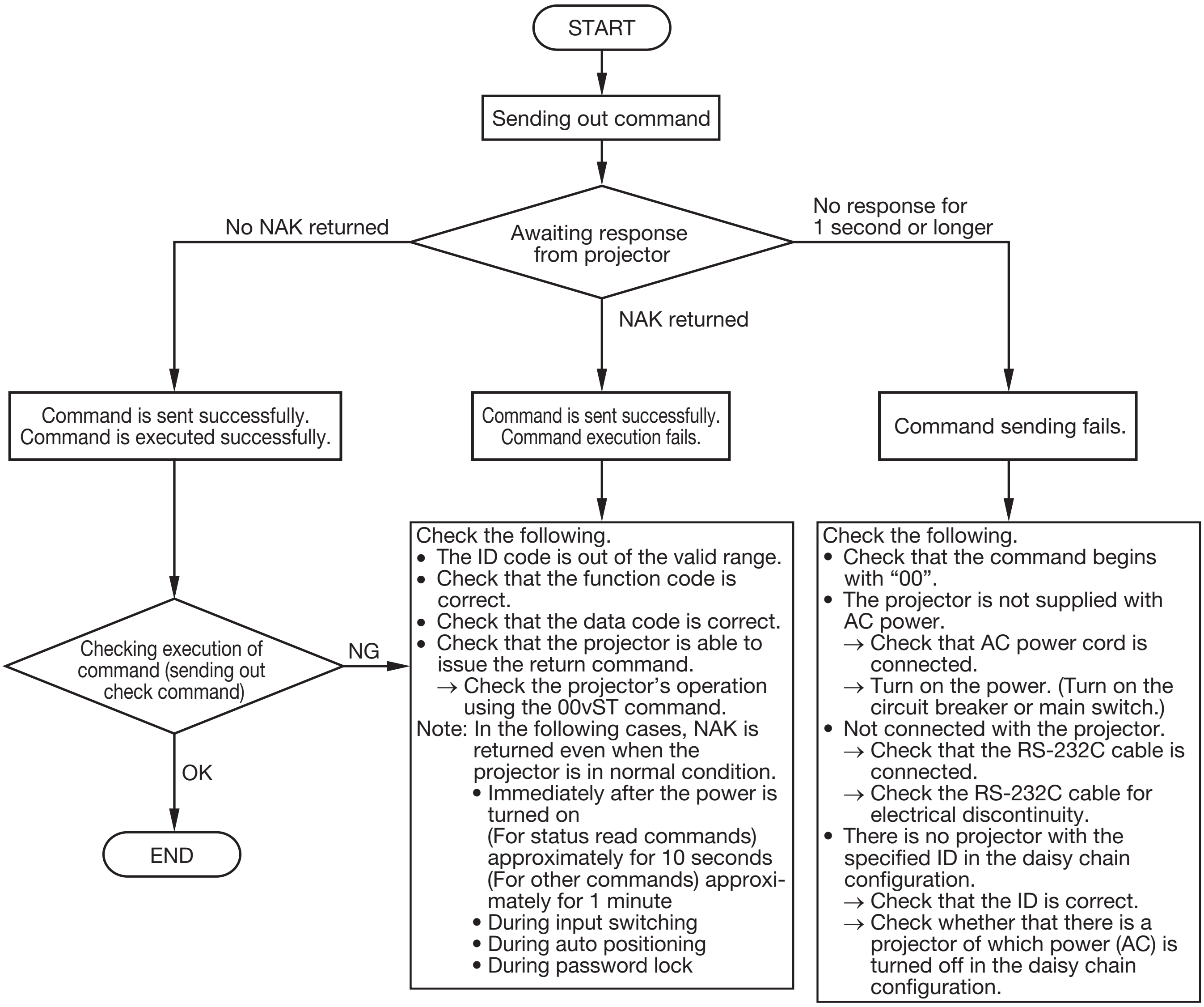
Command sent from the PC	Status code returned from the projector	Description
30’ ‘30’ ‘5F’ ‘76’ ‘31’ ‘0D’ 00_v1↵		(During auto positioning) Command for selecting VIDEO as the input signal is sent out.
	‘30’ ‘30’ ‘5F’ ‘76’ ‘31’ ‘3A ’‘4E’ ‘0D’ 00_v1:N↵	The command is received by the projector but cannot be executed. (NAK return)

- When ID is specified (when the command is sent to the projector with the ID of “01” or “ALL”):

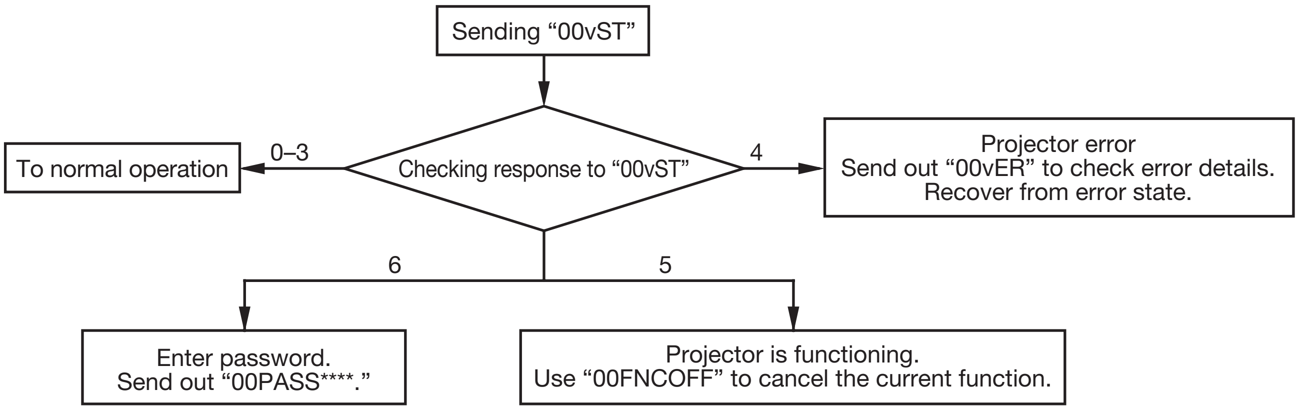
Command sent from the PC	Status code returned from the projector	Description
‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘5F’ ‘76’ ‘31’ ‘0D’ 00;01;_v1↵		(During auto positioning) Command for selecting VIDEO as the input signal is sent to the projector with the ID of “01” or “ALL.”
	‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘5F’ ‘76’ ‘31’ ‘3A’ ‘4E’ ‘0D’ 00;01;_v1:N↵	The projector with the ID of “01” or “ALL” receives the command, but cannot execute it. (NAK return)

- The flowchart on the next page shows the recommended operating sequence for your reference to create a program.

[RS-232C control flowchart]



[Method of checking state of projector]



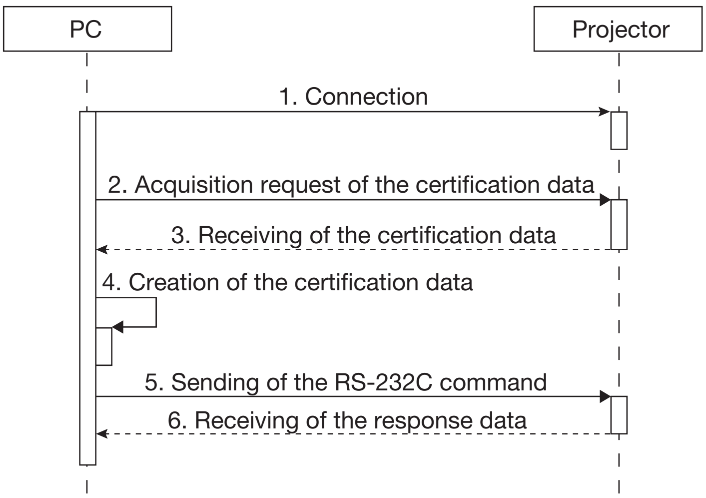
4. Execution procedure of RS-232C commands via LAN

- When you use the LAN function, set the STANDBY MODE to STANDARD or LAN.
- When you execute RS-232C commands via LAN, check that the CONTROL SYSTEM in the NETWORK menu is set to STANDARD.
- You can change the certification password using the NETWORK PASSWORD in the NETWORK menu. The default password is "admin."
- You can skip the certification process by setting the NETWORK CERTIFICATION in the NETWORK menu to OFF. When you skip the certification process, Steps 2 to 4 described below can be skipped and you can send RS-232C commands without adding a certification data.
  Example:
    Sending the PON command (00!) while the NETWORK CERTIFICATION is set to OFF
    00!↵

For the procedure to set the menu, refer to the User Manual supplied with the projector.

To execute the RS-232C command via LAN while the NETWORK CERTIFICATION is set to ON, a 32-byte connection certification data must be added before the RS-232C command.
To create a 32-byte certification data, following information and procedure are required.

- Random character string for creating the certification data that is acquired from the projector (8 characters)
- Network password of the projector (1 to 32 characters)
- MD5 hash calculation
- Based on the above, the execution procedures to connect to the projector and send the RS-232C commands while the NETWORK CERTIFICATION is set to ON are described below.
  1. Connect to Port 63007 of the projector from the PC as a TCP/IP client.
  2. After completing the connection, send the acquisition request for the certification data ("*$AK*↵") (ASCII code: 24 41 4B 0D) from the PC to the projector.
  3. Acquire "*$AK********↵*" on the PC as the response of the request sent in Step 2. (********: Random character string for creating the certification data)
  4. Create the certification data on the PC.
     - Create the key of the certification data by linking the data acquired in Step 3 with the network character string.
       For example, when the random character string is 12345678 and the password is ABCD, the key of the certification data is 12345678ABCD (character string in ASCII code).
     - Run MD5 hash on the key of the certification data.
     - Create the certification data by converting the hash-calculated 16-byte data into the ASCII code character string.
       Example:
         Calculation result: [4f][3c][5d][a1][7b][4f][b5][ed][2c][99][4e][bb][f6][57][67][54] (hexadecimal numeral)
         Certification data: 4f 3c 5d a1 7b 4f b5 ed 2c 99 4e bb f6 57 67 54 (character string in ASCII code)
  5. Send the RS-232C command with the certification data from the PC to the projector.
     Example:
       To send the PON command (00!↵) using the certification data created in Step 4:
       4f3c5da17b4fb5ed2c994ebbf657675400!↵
  6. Receive the response from the projector on the PC.
     Response data has the following patterns.
     Normal: *00!*↵ (Parameter is added depending on the command.)
     Error in the certification data: *PRV=ERRA*↵
     Command error: *00!:N*↵



5. Command list
5.1 General control commands

The general control commands are used for the basic operation setting of this projector. They may not be executed while the signals are changed. The general control commands have no data codes. (When the commands for input select are sent while the splash screen is being displayed, the splash screen is only canceled.)

ITEM	Function		Note
	Character	ASCII code	
POWER ON	!	21h	This command is invalid for 2 minutes after the power is turned off.
POWER OFF	"	22h	This command is invalid for 1 minute after the power is turned on.
INPUT COMPUTER 1	_r1	5Fh 72h 31h	This command is not received during stand-by, BLANK, and input switch control with the contact control.
INPUT COMPUTER 2	_r2	5Fh 72h 32h	This command is not received during stand-by, BLANK, and input switch control with the contact control.
INPUT HDMI	_d1	5Fh 64h 31h	This command is not received during stand-by, BLANK, and input switch control with the contact control.
INPUT DVI	_d2	5Fh 64h 32h	This command is not received during stand-by, BLANK, and input switch control with the contact control.
INPUT SDI *1	_d3	5Fh 64h 33h	This command is not received during stand-by, BLANK, and input switch control with the contact control.
INPUT VIDEO	_v1	5Fh 76h 31h	This command is not received during stand-by, BLANK, and input switch control with the contact control.
INPUT S-VIDEO	_v2	5Fh 76h 32h	This command is not received during stand-by, BLANK, and input switch control with the contact control.

*1: This function works only on UD8900U.

[Example] When setting the input signal to COMPUTER 1. (Values enclosed in quotation marks are ASCII codes.):

- When ID is not specified:

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '5F' '72' '31' '0D' 00_r1 ↵		Command for setting the input signal to COMPUTER 1 (ID command is omitted.)
	'30' '30' '5F' '72' '31' '0D' 00_r1 ↵	Command receipt confirmation (The statuses are echoed back as many as the number of the connected projectors.)

- When ID is specified (when the command is sent to the projector with the ID of "01" or "ALL"):

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '3B' '30' '31' '3B' '5F' '72' '31' '0D' 00;01;_r1 ↵		Command for setting the input signal to COMPUTER 1 is sent to the projector with the ID of "01" or "ALL."
	'30' '30' '3B' '30' '31' '3B' '5F' '72' '31' '0D' 00;01;_r1 ↵	The projector with the ID of "01" or "ALL" receives the command. (The status is echoed back from the projector with the ID of "01" or "ALL.")

5.2 Reading commands
5.2.1 Status read commands

The projectors operating status, such as POWER-ON/OFF and the currently selected input terminal, etc. can be monitored.

ITEM	Function		Data (Receive)		Status
	Character	ASCII	Character	ASCII	
POWER	vP	76h 50h	1	31h	POWER ON
			0	30h	POWER OFF
INPUT	vI	76h 49h	r1	72h 31h	INPUT COMPUTER 1
			r2	72h 32h	INPUT COMPUTER 2
			d1	64h 31h	INPUT HDMI
			d2	64h 32h	INPUT DVI
			d3	64h 33h	INPUT SDI *1
			v1	76h 31h	INPUT VIDEO
			v2	76h 32h	INPUT S-VIDEO
P-ON/OFF ENABLED/ DISABLED	vPK	76h 50h 4Bh	0	30h	POWER ON/OFF DISABLED
			1	31h	POWER ON/OFF ENABLED
SIGNAL INPUT	vSM	76h 53h 4Dh	0	30h	NO SIGNAL SUPPLIED
			1	31h	SIGNAL SUPPLIED

*1: This function works only on UD8900U.

5.2.2 Read commands for items in INFORMATION menu

Use the following commands to obtain the values of the items in the INFORMATION menu.

ITEM	Function		Data (Receive)
	Character	ASCII code	
LAMP 1 TIME (LOW)	vLE1L	76h 4Ch 45h 31h 4Ch	hhhhmm
LAMP 2 TIME (LOW)	vLE2L	76h 4Ch 45h 32h 4Ch	hhhhmm
LAMP illuminating status (an icon displayed at the right of the lamp operating time)	vLST	76h 4C 53h 54h	ab The following value is entered in a and b. 0 (Off), 1 (On), 2 (Error)
NEXT LAMP RELAY	vNLR	76h 4Eh 4Ch 52h	dhh
FILTER TIME	vFLTT	76h 46h 4Ch 54h 54h	hhhhh
SERIAL NUMBER	vS/N	76h 53h 2Fh 4Eh	*******(within 7 characters)
RESOLUTION	vRESO	76h 52h 45h 53h 4Fh	HHHHxVVVV
VERTICAL FREQUENCY	vVFREQ	76h 56h 46h 52h 45h 51h	***.**
HORIZONTAL FREQUENCY	vHFREQ	76h 48h 46h 52h 45h 51h	***.**
SYNC. TYPE	vSYNCT	76h 53h 59h 4Eh 43h 54h	0 (NO SIGNAL), 1 (Invalid), 3 (3wire), 4 (4wire), 5 (5wire), 6 (SCART)

"hhhh" and "mm" represent hours and minutes respectively.
"d" and "hh" represent days and hours respectively.
"a" and "b" represent the lamp illuminating status of the LAMP 1 and LAMP 2 respectively.
"hhhh" represents the operating time.
"HHHH" and "VVVV" represent the horizontal and vertical resolutions respectively.
"***.**" represents the vertical frequency (in Hz) or the horizontal frequency (in kHz).

5.2.3 Read commands for other information

Use the following commands to obtain other information.

ITEM	Function		Data (Receive)
	Character	ASCII code	
Model name	vMDL	76h 4Dh 44h 4Ch	****************(within 16 characters)
Contact control	vRMT	76h 52h 4Dh 54h	0 (Normal operation) 1 (Contact control)
Input source	vSOUCE	76h 53h 4Fh 55h 43h 45h	r1 r2 v1 v2 d1 d2 d3 (UD8900U) r1 r2 v1 v2 d1 d2 (UD8850U)
Projector status	vST	76h 53h 54h	0 (Stand-by mode), 1 (Within 1 minute after POWER-ON (warm-up mode)), 2 (POWER-ON mode (including state of warning)), 3 (Cooling mode), 4 (Abnormal state (including shutdown due to an error)), 5 (State of functioning (menu display, dialog display, BLANK, SPLIT, FREEZE, etc.)), 6 (Awaiting password entry)
Error status	vER	76h 45h 52h	Reading of the error status data (3 digits, hexadecimal numbers, total 9 bits) (MSB) xb1, xb2... xb8, xb9, 0, 0, 0 (LSB) xb1(800): Fan error xb2(400): Lamp error (The lamp goes out or does not light.) xb3(200): Lamp warning 1 (The lamp life has expired.) xb4(100): Lamp warning 2 (The lamp life is expiring.) xb5(080): Temperature error xb6(040): The temperature warning is being indicated. xb7(020): Lamp cover open error xb8(010): Filter/filter cover open error xb9(008): States of other component abnormality When only one error occurs, value shown in parentheses is returned. When multiple errors occur at the same time, the bits of all the occurred error are set. Example) C00: When fan error and lamp error occur at the same time 180: When lamp warning 2 and temperature error occur at the same time

The PC sends the command without attaching the data code to it. On the other hand, the projector attaches to the received command its current operating status as the data code and send it back to the PC.

[Example] When checking the currently selected input terminal (when the INPUT VIDEO is being selected). (Values enclosed in quotation marks are ASCII codes.):

- When ID is not specified:

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘76’ ‘49’ ‘0D’ 00vI↵		Command for checking the input terminal (ID command is omitted.)
	‘30’ ‘30’ ‘76’ ‘49’ ‘76’ ‘31’ ‘0D’ 00vIv1↵	Check result (VIDEO)

- When ID is specified (when the command is sent to the projector with the ID of “01” or “ALL”):

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘76’ ‘49’ ‘0D’ 00;01;vI↵		Command for checking the input terminal is sent to the projector with the ID of “01” or “ALL.”
	‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘76’ ‘49’ ‘76’ ‘31’ ‘0D’ 00;01;vIv1↵	Check result (VIDEO) (The status is echoed back from the projector with the ID of “01” or “ALL.”)

5.3 **Remote control key commands** (Not executable in stand-by mode. When the remote control key commands are sent while the splash screen is being displayed, the splash screen is only canceled.)

The remote control key commands allow the computer to control the projector in the same way as by the remote control. (The CONTROLLER ID cannot be set. And some operations cannot be controlled.) The remote control key commands have no data codes.

Button’s name on remote control	Function	
	Character	ASCII code
+	r06	72h 30h 36h
-	r07	72h 30h 37h
ZOOM/FOCUS	r0f	72h 30h 66h
LENS SHIFT	r47	72h 34h 37h
GEOMETRY	r43	72h 34h 33h
PinP/SPLIT (SPLIT only)	r04	72h 30h 34h
BLANK	ra6	72h 61h 36h
▲	r53	72h 35h 33h
▼	r2b	72h 32h 62h
◀	r4f	72h 34h 66h
▶	r59	72h 35h 39h
MENU	r54	72h 35h 34h
ENTER	r10	72h 31h 30h
AUTO POSITION	r09	72h 30h 39h
FREEZE	ra4	72h 61h 34h
ASPECT	re2	72h 65h 32h
CE	re7	72h 65h 37h
TEST PATTERN	r50	72h 35h 30h
SUPER RESOLUTION	r96	72h 39h 36h
1 (numeric keypad)	r49	72h 34h 39h
2 (numeric keypad)	r4a	72h 34h 61h
3 (numeric keypad)	r4b	72h 34h 62h
4 (numeric keypad)	r4c	72h 34h 63h
5 (numeric keypad)	r4d	72h 34h 64h
6 (numeric keypad)	r4e	72h 34h 65h
7 (numeric keypad)	r88	72h 38h 38h
8 (numeric keypad)	r58	72h 35h 38h
9 (numeric keypad)	r89	72h 38h 39h
0 (numeric keypad)	r48	72h 34h 38h
ALL	r5a	72h 35h 61h

[Example] When displaying the MENU selection bar. (Values enclosed in quotation marks are ASCII codes.):

- When ID is not specified:

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '72' '35' '34' '0D' 00r54↵		Command operating the same as the MENU button (ID command is omitted.)
	'30' '30' '72' '35' '34' '0D' 00r54↵	Command receipt confirmation (The statuses are echoed back as many as the number of the connected projectors.)

- When ID is specified (when the command is sent to the projector with the ID of "01" or "ALL"):

Command sent from the PC, etc.	Status code returned from the projector	Description
'30' '30' '3B' '30' '31' '3B' '72' '35' '34' '0D' 00;01;r54↵		Command operating the same as the MENU button is sent to the projector with the ID of "01" or "ALL."
	'30' '30' '3B' '30' '31' '3B' '72' '35' '34' '0D' 00;01;r54↵	Command receipt confirmation (The status is echoed back from the projector with the ID of "01" or "ALL.")

5.4 Direct commands (Not executable in stand-by mode. Possible only to read during BLANK.)

The direct commands are used to numerically adjust the geometrical correction and bright uniformity correction.

When the computer sends the command without adding the setting value, the projector returns the received command with the current setting value added as a data code.

ITEM	Function		Data
	Character	ASCII code	
KEYSTONE (vertical)	KS	4Bh 53h	±40 With CURVED-adjustment : ±10
KEYSTONE (horizontal)	KSH	4Bh 53h 48h	±25 With CURVED-adjustment : ±10
KEYSTONE reset	KSRST	4Bh 53h 52h 53h 54h	
CORNERSTONE LOWER RIGHT (vertical)	CNLRV	43h 4Eh 4Ch 52h 56h	±99
CORNERSTONE LOWER RIGHT (horizontal)	CNLRH	43h 4Eh 4Ch 52h 48h	±99
CORNERSTONE LOWER LEFT (vertical)	CNLLV	43h 4Eh 4Ch 52h 56h	±99
CORNERSTONE LOWER LEFT (horizontal)	CNLLH	43h 4Eh 4Ch 52h 48h	±99
CORNERSTONE UPPER RIGHT (vertical)	CNURV	43h 4Eh 55h 52h 56h	±99
CORNERSTONE UPPER RIGHT (horizontal)	CNURH	43h 4Eh 55h 52h 48h	±99
CORNERSTONE UPPER LEFT (vertical)	CNULV	43h 4Eh 55h 52h 56h	±99
CORNERSTONE UPPER LEFT (horizontal)	CNULH	43h 4Eh 55h 52h 48h	±99
CORNERSTONE reset	CKSRST	43h 4Bh 53h 52h 53h 54h	
HORIZ. CURVED ARC	CVAH	43h 56h 41h 48h	±99 With KEYSTONE- or CORNERSTONE-adjustment : ±30
VERT. CURVED ARC	CVAV	43h 56h 41h 56h	±99 With KEYSTONE- or CORNERSTONE-adjustment : ±30
HORIZ. CURVED ORIGIN (vertical)	CVHOV	43h 56h 48h 4Fh 56h	±10
HORIZ. CURVED ORIGIN (horizontal)	CVHOH	43h 56h 48h 4Fh 48h	±10
VERT. CURVED ORIGIN (vertical)	CVVOV	43h 56h 56h 4Fh 56h	±10
VERT. CURVED ORIGIN (horizontal)	CVVOH	43h 56h 56h 4Fh 48h	±10
CURVED reset	CVRST	43h 56h 52h 53h 54h	
BRIGHT UNIFORMITY CORRECTION (level)	BUCL	42h 55h 43h 4Ch	050 to 100 (Changeable in five increments)
BRIGHT UNIFORMITY CORRECTION (correcting position) (vertical)	BUCV	42h 55h 43h 56h	1 to 7
BRIGHT UNIFORMITY CORRECTION (correcting position) (horizontal)	BUCH	42h 55h 43h 48h	1 to 7

How to set the value

Use the character or ASCII code as shown below to set the value.

Character	+	-	0	1	2	3	4	5	6	7	8	9
ASCII code	'2Bh'	'2Dh'	'30h'	'31h'	'32h'	'33h'	'34h'	'35h'	'36h'	'37h'	'38h'	'39h'

5.5 Function commands (Not executable in stand-by mode. When the mute commands are sent while the splash screen is being displayed, the splash screen is only canceled.)

ITEM	Function		Data
	Character	ASCII code	
BLANK	MUTE	4Dh 55h 54h 45h	0 (OFF), 1 (ON)
SPLIT	SPLT	53h 50h 4Ch 54h	0 (OFF), 1 (ON)
FREEZE	FRZ	46h 52h 5Ah	0 (OFF), 1 (ON)
Function canceling	FNCOFF	46h 4Eh 43h 4Fh 46h 46h	
TEST PATTERN	TP	54h 50h	0 (OFF), 1 (CROSS HATCH R), 2 (CROSS HATCH G), 3 (CROSS HATCH B), 4 (WHITE), 5 (BLACK), 6 (H. COLOR BARS), 7 (V. COLOR BARS)
Change of the initial value of ASPECT	SCDEF	53h 43h 44h 45h 46h	0:NORMAL, 1:FULL

5.6 Menu setting commands (Not executable in stand-by mode except some commands. Possible only to read during BLANK except some commands.)

The menu setting commands are used for the menu setting of this projector. If the personal computer sends the command without attaching the data code, the projector attaches to the received command its current setting value as the data code and send it back to the PC.

5.6.1 IMAGE menu

ITEM	Function		Data
	Character	ASCII code	
COLOR ENHANCER	CE	43h 45h	0 (AUTO), 1 (PRESENTATION), 2 (STANDARD), 3 (THEATER), 4 (sRGB), 5 (CLEAR BASE), 6 (BLUE BASE), 7 (USER), 8 (MULTI-SCREEN)
COLOR ENHANCER-USER-GAMMA MODE	CEU1GS	43h 45h 55h 31h 47h 53h	0 (DYNAMIC), 1 (NATURAL), 2 (DETAIL)
COLOR ENHANCER-USER-BrilliantColor™	CEU1B	43h 45h 55h 31h 42h	00–10
COLOR ENHANCER-USER-DYNAMIC CONTRAST	CEU1DC	43h 45h 55h 31h 44h 43h	0 (OFF), 1 (1), 2 (2), 3 (3)
COLOR ENHANCER-MULTI-SCREEN-GAMMA MODE	CEU2GS	43h 45h 55h 32h 47h 53h	0 (1.8), 1 (2.0), 2 (2.2)
COLOR ENHANCER-MULTI-SCREEN-BrilliantColor™	CEU2B	43h 45h 55h 32h 42h	00 to 10
SUPER RESOLUTION	DHD	44h 48h 44h	0 (OFF), 1 (ON)
SUPER RESOLUTION-LEVEL	DHDLV	44h 48h 44h 4Ch 56h	1 to 5
CONTRAST	PP	50h 50h	±30
BRIGHTNESS	QQ	51h 51h	±30
COLOR MATRIX	CMT	43h 4Dh 54h	1 (COMPUTER), 2 (VIDEO), 3 (FLAT), 4 (USER)
COLOR MATRIX -USER-BASE	CMTBASE	43h 4Dh 54h 42h 41h 53h 45h	1 (COMPUTER), 2 (VIDEO), 3 (FLAT)
COLOR MATRIX -USER-R/G/B	MRGB	4Dh 52h 47h 42h	± 30 ± 30 ± 30 (R+G+B)
COLOR MATRIX -USER-Y/C/M	MYCM	4Dh 59h 43h 4Dh	± 30 ± 30 ± 30 (Y+C+M)
COLOR MATRIX -USER-SATURATION	MSAT	4Dh 53h 41h 54h	± 05
COLOR MATRIX -USER-RGB-TINT	MT	4Dh 54h	± 15
COLOR TEMP.	A	41h	1 (STANDARD), 2 (HIGH), 3 (LOW), 4 (USER)
COLOR TEMP.-USER-CONTRAST	P	50h	±30 ±30 ±30 (R, G, B)
COLOR TEMP.-USER-BRIGHTNESS	Q	51h	±30 ±30 ±30 (R, G, B)
COLOR	T	54h	±10
TINT	S	53h	±10
SHARPNESS	R	52h	±05

ITEM	Function		Data
	Character	ASCII code	
NOISE REDUCTION	NR	4Eh 52h	0 (OFF), 1 (ON)
CTI	CTI	43h 54h 49h	0 (OFF), 1 (ON)
INPUT LEVEL	IPL	49h 50h 4Ch	±5, For DVI/SDI*1 input: +0 (NORMAL), +1 (ENHANCED) For HDMI input: +0 (AUTO), +1 (NORMAL), +2 (ENHANCED)
CLOSED CAPTION	CC	43h 43h	0 (OFF), 1 (CC1), 2 (CC2)
DEMO MODE	DM	44h 4Dh	0 (OFF), 1 (ALL), 2 (DYNAMIC CONTRAST), 3 (SUPER RESOLUTION), 4 (COLOR MATRIX)

*1: SDI function works only on UD8900U.

5.6.2 INSTALLATION 1 menu

ITEM	Function		Data
	Character	ASCII code	
LAMP MODE	LM	4Ch 4Dh	0 (STANDARD), 1 (LOW)
LAMP SELECT	LS	4Ch 53h	0 (DUAL), 1 (SINGLE), 2 (LAMP 1), 3 (LAMP 2)
LAMP RELAY	LR	4Ch 52h	xdhh x: Lamp relay interval When DUAL is selected: 0 (OFF), 1 (1H/24H), 2 (2H/1W) When SINGLE is selected: 0 (OFF), 1 (24H), 2 (1WEEK) dhh: Next lamp relay time (d: days, hh: hours) DUAL-OFF: Fixed to 0 days 00 hours DUAL-1H/24H: Max. 0 days and 23 hours DUAL-2H/1W: Max. 6 days and 22 hours SINGLE-OFF: Fixed to 0 days 00 hours SINGLE-1H/24H: Max. 0 days and 24 hours SINGLE-1 WEEK: Max. 7 days and 00 hours
STANDBY MODE	STBY	53h 54h 42h 59h	0 (STANDARD), 1 (LOW)
IMAGE REVERSE	IR	49h 52h	0 (OFF), 1 (MIRROR), 2 (INVERT), 3 (MIRROR INVERT)
HIGH ALTITUDE MODE	ALTI	41h 4Ch 54h 49h	0 (STANDARD), 1 (HIGH ALTITUDE)
ZOOM/FOCUS LOCK	FZL	46h 5Ah 4Ch	0 (OFF), 1 (ON)
LENS SHIFT LOCK	LSL	4Ch 53h 4Ch	0 (OFF), 1 (ON)
LENS SHIFT RESET	LSRST	4Ch 53h 52h 53h 54h	

5.6.3 INSTALLATION 2 menu

ITEM	Function		Data
	Character	ASCII code	
AUTO POWER ON	APON	41h 50h 4Fh 4Eh	0 (OFF), 1 (ON)
AUTO POWER OFF	APOF	41h 50h 4Fh 46h	0 (OFF), 1 (5min), 2 (10min), 3 (15min), 4 (30min), 5 (60min), 6 (4hour), 7 (8hour)
SCREEN	SCR	53h 43h 52h	0 (16:10), 1 (16:9), 2 (4:3)
SPLASH SCREEN	SS	53h 53h	0 (OFF), 1 (ON)
BACK COLOR	BB	42h 42h	0 (BLACK), 1 (BLUE), 2 (IMAGE)
DVI LONG CABLE (MODE)	DVIC	44h 56h 49h 43h	0 (AUTO), 1 (MANUAL)
DVI LONG CABLE (LEVEL)	DVICLV	44h 56h 49h 43h 4Ch 56h	00 to 21
REMOTE 1 MODE (PIN 2)	R1M2P	52h 31h 4Dh 32h 50h	0 (NONE), 1 (POWER)
REMOTE 1 MODE (PIN 3)	R1M3P	52h 31h 4Dh 33h 50h	0 (NONE), 1 (COMPUTER 1), 2 (COMPUTER 2), 3 (VIDEO), 4 (S-VIDEO), 5 (DVI), 6 (HDMI), 7 (SDI)*1
REMOTE 1 MODE (PIN 4)	R1M4P	52h 31h 4Dh 34h 50h	0 (NONE), 1 (COMPUTER 1), 2 (COMPUTER 2), 3 (VIDEO), 4 (S-VIDEO), 5 (DVI), 6 (HDMI), 7 (SDI)*1
REMOTE 1 MODE (PIN 5)	R1M5P	52h 31h 4Dh 35h 50h	0 (NONE), 1 (COMPUTER 1), 2 (COMPUTER 2), 3 (VIDEO), 4 (S-VIDEO), 5 (DVI), 6 (HDMI), 7 (SDI)*1
REMOTE 1 MODE (PIN 6)	R1M6P	52h 31h 4Dh 36h 50h	0 (NONE), 1 (COMPUTER 1), 2 (COMPUTER 2), 3 (VIDEO), 4 (S-VIDEO), 5 (DVI), 6 (HDMI), 7 (SDI)*1
REMOTE 1 MODE (PIN 7)	R1M7P	52h 31h 4Dh 37h 50h	0 (NONE), 1 (COMPUTER 1), 2 (COMPUTER 2), 3 (VIDEO), 4 (S-VIDEO), 5 (DVI), 6 (HDMI), 7 (SDI)*1
REMOTE 1 MODE (PIN 8)	R1M8P	52h 31h 4Dh 38h 50h	0 (NONE), 1 (BLANK)

ITEM	Function		Data
	Character	ASCII code	
REMOTE 1 MODE (RESET)	R1MRST	52h 31h 4Dh 52h 53h 54h	
FILTER MENU (CLEANUP PERIOD)	FLCP	46h 4Ch 43h 50h	xdhh x: Cleanup interval 0 (OFF), 1 (24H), 2 (1WEEK) dhh: Next cleanup time (d: days, hh: hours) OFF: Fixed to 0 days and 00 hours 24H: Max. 0 days and 24 hours 1 WEEK: Max. 7 days and 00 hours
FILTER MENU (MANUAL CLEANUP)	FLMC	46h 4Ch 4Dh 43h	

*1: This function works only on UD8900U.

5.6.4 MULTI-SCREEN menu

ITEM	Function		Data
	Character	ASCII code	
EDGE BLENDING	EB	45h 42h	0 (OFF), 1 (ON)
EDGE ADJUST (UP)	EBU	45h 42h 55h	0 (OFF), 1 (ON)
EDGE ADJUST (LOW)	EBD	45h 42h 44h	0 (OFF), 1 (ON)
EDGE ADJUST (LEFT)	EBLS	45h 42h 4Ch 53h	0 (OFF), 1 (ON)
EDGE ADJUST (RIGHT)	EBRS	45h 42h 52h 53h	0 (OFF), 1 (ON)
START POSITION (UP)	BSU	42h 53h 55h	000 to 270
START POSITION (LOW)	BSD	42h 53h 44h	000 to 270
START POSITION (LEFT)	BSLS	42h 53h 4Ch 53h	000 to 480
START POSITION (RIGHT)	BSRS	42h 53h 52h 53h	000 to 480
WIDTH (UP)	BWU	42h 57h 55h	004 to 524
WIDTH (LOW)	BWD	42h 57h 44h	004 to 524
WIDTH (LEFT)	BWLS	42h 57h 4Ch 53h	004 to 944
WIDTH (RIGHT)	BWRS	42h 57h 52h 53h	004 to 944
MARKER (UP)	MKRU	4Dh 4Bh 52h 55h	0 (OFF), 1 (ON)
MARKER (LOW)	MKRD	4Dh 4Bh 52h 44h	0 (OFF), 1 (ON)
MARKER (LEFT)	MKRLS	4Dh 4Bh 52h 4Ch 53h	0 (OFF), 1 (ON)
MARKER (RIGHT)	MKRRS	4Dh 4Bh 52h 52h 53h	0 (OFF), 1 (ON)
BLACK LEVEL (INTERLOCKED)	ILK	49h 4Ch 4Bh	0 (OFF), 1 (ON)
BLACK LEVEL (RED)	BKLVR	42h 4Bh 4Ch 56h 52h	000 to 255
BLACK LEVEL (GREEN)	BKLVG	42h 4Bh 4Ch 56h 47h	000 to 255
BLACK LEVEL (BLUE)	BKLVB	42h 4Bh 4Ch 56h 42h	000 to 255
EDGE BLENDING (RESET)	EBRST	45h 42h 52h 53h 54h	
COLOR MATCHING	CMC	43h 4Dh 43h	0 (OFF), 1 (MANUAL), 2 (MEASURE)
COLOR MATCHING-MANUAL (GAIN)	MNTG	4Dh 4Eh 54h 47h	x010 to 100 x: Color selection R (RED), Y (YELLOW), G (GREEN),C (CYAN), B (BLUE), M (MAGENTA)
COLOR MATCHING-MANUAL (SATURATION)	MNTS	4Dh 4Eh 54h 53h	x±30 x: Color selection R (RED), Y (YELLOW), G (GREEN),C (CYAN) B (BLUE), M (MAGENTA)
COLOR MATCHING-MANUAL (HUE)	MNTH	4Dh 4Eh 54h 48h	x±30 x: Color selection R (RED), Y (YELLOW), G (GREEN), C (CYAN) B (BLUE), M (MAGENTA)
COLOR MATCHING-MANUAL (WHITE R)	MNTWR	4Dh 4Eh 54h 57h 52h	010 to 100
COLOR MATCHING-MANUAL (WHITE G)	MNTWG	4Dh 4Eh 54h 57h 47h	010 to 100
COLOR MATCHING-MANUAL (WHITE B)	MNTWB	4Dh 4Eh 54h 57h 42h	010 to 100

ITEM	Function		Data
	Character	ASCII code	
COLOR MATCHING-MANUAL (RESET)	MNRST	4Dh 4Eh 52h 53h 54h	
COLOR MATCHING--MEASURE-MEASURED DATA (Y(Relative value))	MSML	4Dh 53h 4Dh 4Ch	x00050 to 20000 x: Color selection R (RED), G (GREEN), B (BLUE), W (WHITE)
COLOR MATCHING--MEASURE-MEASURED DATA (x)	MSMX	4Dh 53h 4Dh 58h	x*.*** to *.*** x: Color selection R (RED), G (GREEN), B (BLUE), W (WHITE) *.***: The range varies depending on x.
COLOR MATCHING--MEASURE-MEASURED DATA (y)	MSMY	4Dh 53h 4Dh 59h	x*.*** to *.*** x: Color selection R (RED), G (GREEN), B (BLUE), W (WHITE) *.***: The range varies depending on x.
COLOR MATCHING--MEASURE-TARGET DATA (GAIN)	MSTG	4Dh 53h 54h 47h	x010 to 100 x: Color selection R (RED), Y (YELLOW), G (GREEN), C (CYAN) B (BLUE), M (MAGENTA), W (WHITE)
COLOR MATCHING--MEASURE-TARGET DATA (x)	MSTX	4Dh 53h 54h 58h	x*.*** to *.*** x: Color selection R (RED), Y (YELLOW), G (GREEN),C (CYAN) B (BLUE), M (MAGENTA), W (WHITE) *.***: The range varies depending on x.
COLOR MATCHING--MEASURE-TARGET DATA (y)	MSTY	4Dh 53h 54h 59h	x*.*** to *.*** x: Color selection R (RED), Y (YELLOW), G (GREEN),C (CYAN) B (BLUE), M (MAGENTA), W(WHITE) *.***: The range varies depending on x.
COLOR MATCHING--MEASURE (RESET)	MSRST	4Dh 53h 52h 53h 54h	

5.6.5 FEATURE menu

ITEM	Function		Data
	Character	ASCII code	
PROJECTOR ID	PID	50h 49h 44h	00 (ALL), 01 to 63
GROUP ID	GID	47h 49h 44h	A to Z
PASSWORD FUNCTION	PSLOCK	50h 53h 4Ch 4Fh 43h 4Bh	0**** (UNLOCK), 1**** (DISPLAY INPUT), 2**** (MENU ACCESS), 3**** (SPLASH ID SCREEN) **** is a 4 to 8-digit password comprised of any figures 1 to 4.
MENU POSITION	MP	4Dh 50h	0 (Upper left), 1 (Lower right), 4 (Center)
CINEMA MODE	CINE	43h 49h 4Eh 45h	0 (VIDEO), 1 (AUTO), 2 (FILM)
LANGUAGE	LG	4Ch 47h	00 (日本語), 01 (English), 02 (Español), 03 (Deutsch), 04 (Français), 05 (Italiano), 06 (中文), 07 (한국어), 08 (РУССКИй), 09 (PORTUGUÊS), 11 (SVENSKA), 12 (POLSKI), 16 (Nederlands), 17 (Norsk), 18 (اللغة العربية), 19 (Türkçe), 20 (ภาษาไทย), 21 (Bahasa Indonesia), 22 (Melayu), 23 (Tiếng Việt)
VIDEO SIGNAL (VIDEO only)	VS	56h 53h	0 (AUTO), 1 (NTSC), 2 (PAL), 3 (SECAM), 4 (4.43NTSC), 5 (PAL-M), 6 (PAL-N), 7 (PAL-60)
SET UP	STU	53h 54h 55h	0 (AUTO), 1 (OFF), 2 (3.75%), 3 (7.5%)
SCART INPUT	SRT	53h 52h 54h	0 (OFF), 1 (ON)
LAMP WARNING	LW	4Ch 57h	0 (STANDARD), 1 (SHORT TERM)
HIDE OSD	HOSD	48h 4Fh 53h 44h	0 (OFF), 1 (ON)
LAMP 1 TIME RESET	TRST1L	54h 52h 53h 54h 31h 4Ch	
LAMP 2 TIME RESET	TRST2L	54h 52h 53h 54h 32h 4Ch	
FILTER TIME RESET	TRSTFL	54h 52h 53h 54h 46h 4Ch	
RESET ALL	RSTALL	52h 53h 54h 41h 4Ch 4Ch	

5.6.6 SIGNAL menu

ITEM	Function		Data
	Character	ASCII code	
MEMORY CALL	MMC	4Dh 4Dh 43h	0 (AUTO), 1 to 8 (MEMORY 1 to 8)
HORIZ.POSITION	HP	48h 50h	+ (increment), - (decrement)*1
VERT. POSITION	VP	56h 50h	+ (increment), - (decrement)*1
FINE SYNC.	FN	46h 4Eh	00–31
TRACKING	TRK	54h 52h 4Bh	+ (increment), - (decrement)*1
COMPUTER INPUT	CIN	43h 49h 4Eh	0 (RGB), 1 (YC_BC_R/YP_BP_R), 2 (AUTO)
OVER SCAN	VOS	56h 4Fh 53h	00 (90%) – 10 (100%)
HOLD	HLD	48h 4Ch 44h	0 (OFF), 1 (ON)
HOLD BEGIN	HLB	48h 4Ch 42h	00–99
HOLD END	HLE	48h 4Ch 45h	00–99
ASPECT	SC	53h 43h	0 (NORMAL, 1 (16:9), 2 (NATIVE), 3 (FULL), 4 (USER)
ASPECT-USER-ZOOM(H)	ZMH	5Ah 4Dh 48h	050 to 500 NAK is returned when the ASPECT setting is other than USER.
ASPECT-USER-ZOOM(V)	ZMV	5Ah 4Dh 56h	050 to 500 NAK is returned when the ASPECT setting is other than USER.
ASPECT-USER-HORIZ. POSITION	AHP*	41h 48h 50h	*:+, - +:incriment -:decriment NAK is returned when the ASPECT setting is other than USER.
ASPECT-USER-VERT. POSITION	AVP*	41h 56h 50h	*:+, - +:incriment -:decriment NAK is returned when the ASPECT setting is other than USER.
ASPECT-USER-RASTER POSITION(H)	RPH*	52h 50h 48h	*:+, - +:incriment -:decriment NAK is returned when the ASPECT setting is other than USER.
ASPECT-USER-RASTER POSITION(V)	RPV*	52h 50h 56h	*:+, - +:incriment -:decriment NAK is returned when the ASPECT setting is other than USER.
ASPECT-USER-RESET	ASRST	41h 53h 52h 53h 54h	The setting contents of ASPECT USER are reset. NAK is returned when the ASPECT setting is other than USER.
CLAMP POSITION	CLP	43h 4Ch 50h	001 to 255
CLAMP WIDTH	CLW	43h 4Ch 57h	01 to 63
VERT. SYNC.	VSC	56h 53h 43h	0 (AUTO), 1 (OFF)
LPF	LPF	4Ch 50h 46h	0 (OFF), 1 (ON)
SHUTTER(U)	SHU	53h 48h 55h	000 to 259
SHUTTER(L)	SHL	53h 48h 4Ch	000 to 259
SHUTTER(LS)	SHLS	53h 48h 4Ch 53h	000 to 311
SHUTTER(RS)	SHRS	53h 48h 52h 53h	000 to 311

*1) Setting range differs depending on the input signals.

5.6.7 NETWORK menu

ITEM	Function		Data
	Character	ASCII code	
PROJECTOR NAME	NAME	4Eh 41h 4Dh 45h	Up to 15 single-byte alphanumeric characters Effective only during P-ON.
NETWORK RESTART	NRCN	4Eh 52h 43h 4Eh	LAN microcomputer is reset and restarted.

- Some commands are not executed depending on the input signal. The operational restrictions same as those on the menu setting are applied. Refer to “Menu operation” in the User Manual for more details.

How to set the value

Use the character or ASCII code as shown below to set the value.

Character	+	-	0	1	2	3	4	5	6	7	8	9
ASCII code	‘2Bh’	‘2Dh’	‘30h’	‘31h’	‘32h’	‘33h’	‘34h’	‘35h’	‘36h’	‘37h’	‘38h’	‘39h’

[Example 1] When setting the AUTO POWER ON to ON. (Values enclosed in quotation marks are ASCII codes.):

- When ID is not specified:

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘41’ ‘50’ ‘4F’ ‘4E’ ‘31’ ‘0D’ 00APON1↵		Command for setting the AUTO POWER ON to ON (ID command is omitted.)
	‘30’ ‘30’ ‘41’ ‘50’ ‘4F’ ‘4E’ ‘31’ ‘0D’ 00APON1↵	Command receipt confirmation (The statuses are echoed back as many as the number of the connected projectors.)

- When ID is specified (when the command is sent to the projector with the ID of “01” or “ALL”):

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘41’ ‘50’ ‘4F’ ‘4E’ ‘31’ ‘0D’ 00;01;APON1↵		Command for setting the AUTO POWER ON is sent to the projector with the ID of “01” or “ALL.”
	‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘41’ ‘50’ ‘4F’ ‘4E’ ‘31’ ‘0D’ 00;01;APON1↵	Command receipt confirmation (The status is echoed back from the projector with the ID of “01” or “ALL.”)

[Example 2] When setting the CONTRAST R of the COLOR TEMP.-USER to +10, the CONTRAST G to 0, and the CONTRAST B to -5. (Values enclosed in quotation marks are ASCII codes.):

- When ID is not specified:

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘50’ ‘2B’ ‘31’ ‘30’ ‘2B’ ‘30’ ‘30’ ‘2D’ ‘30’ ‘35’ ‘0D’ 00P+10+00-05↵		Command for setting the picture control (ID command is omitted.)
	‘30’ ‘30’ ‘50’ ‘2B’ ‘31’ ‘30’ ‘2B’ ‘30’ ‘30’ ‘2D’ ‘30’ ‘35’ ‘0D’ 00P+10+00-05↵	Command receipt confirmation (The statuses are echoed back as many as the number of the connected projectors.)

- When ID is specified (when the command is sent to the projector with the ID of “01” or “ALL”):

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘50’ ‘2B’ ‘31’ ‘30’ ‘2B’ ‘30’ ‘30’ ‘2D’ ‘30’ ‘35’ ‘0D’ 00;01;P+10+00-05↵		Command for setting the CONTRAST is sent to the projector with the ID of “01” or “ALL.”
	‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘50’ ‘2B’ ‘31’ ‘30’ ‘2B’ ‘30’ ‘30’ ‘2D’ ‘30’ ‘35’ ‘0D’ 00;01;P+10+00-05↵	Command receipt confirmation (The status is echoed back from the projector with the ID of “01” or “ALL.”)

[Example 3] When checking the TINT setting (when the TINT is set to +10). (Values enclosed in quotation marks are ASCII codes.):

- When ID is not specified:

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘53’ ‘0D’ 00S↵		Command for checking the TINT setting (ID command is omitted.)
	‘30’ ‘30’ ‘53’ ‘2B’ ‘31’ ‘30’ ‘0D’ 00S+10↵	Check result (+10) (The statuses are echoed back as many as the number of the connected projectors.)

- When ID is specified (when the command is sent to the projector with the ID of “01” or “ALL”):

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘53’ ‘0D’ 00;01;S↵		Command for checking the TINT setting is sent to the projector with the ID of “01” or “ALL.”
	‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘53’ ‘2B’ ‘31’ ‘30’ ‘0D’ 00;01;S+10↵	Check result (+10) (The status is echoed back from the projector with the ID of “01” or “ALL.”)

[Example 4] When setting the GAMMA MODE of the COLOR ENHANCER-USER to DETAIL. (Values enclosed in quotation marks are ASCII codes.):

- When ID is not specified:

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘43’ ‘45’ ‘55’ ‘31’ ‘47’ ‘53’ ‘32’ ‘0D’ 00CEU1GS2↵		Command for setting the picture control (ID command is omitted.)
	‘30’ ‘30’ ‘43’ ‘45’ ‘55’ ‘31’ ‘47’ ‘53’ ‘32’ ‘0D’ 00CEU1GS2↵	Command receipt confirmation (The statuses are echoed back as many as the number of the connected projectors.)

- When ID is specified (when the command is sent to the projector with the ID of “01” or “ALL”):

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘43’ ‘45’ ‘55’ ‘31’ ‘47’ ‘53’ ‘32’ ‘OD’ 00;01;CEU1GS2↵		Command for setting the GAMMA MODE of the COLOR ENHANCER-USER is sent to the projector with the ID of “01” or “ALL.”
	‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘43’ ‘45’ ‘55’ ‘31’ ‘47’ ‘53’ ‘32’ ‘OD’ 00;01;CEU1GS2↵	Command receipt confirmation (The status is echoed back from the projector with the ID of “01” or “ALL.”)

5.7 Password lock commands

The password lock commands control the password lock. The password lock enabling or disabling command is sent with a 4 to 8-digit password comprised of any figures 1 to 4 added to the end of the data code. When the password lock is enabled or disabled successfully, the projector sends a return command comprising the data code, password, and “1” at the end. When enabling or disabling the password lock fails, it sends a return command with “0” at the end. There is no reconfirmation of the password. The password input command is for enabling projection of image when password lock has been set to DISPLAY INPUT. The password input command is sent with a 4 to 8-digit password comprised of any figures 1 to 4 at the end.

ITEM	Function		Data
	Character	ASCII code	
Password lock enabling/ disabling	PSLOCK	50h 53h 4Ch 4Fh 43h 4Bh	0**** (Disabling), 1**** (DISPLAY INPUT), 2**** (MENU ACCESS), 3**** (SPLASH ID SCREEN)
Password input	PASS	50h 41h 53h 53h	****

**** is a 4 to 8-digit password comprised of any figures 1 to 4.

[Example] When enabling the password lock of DISPLAY INPUT (in the case that the password is 123412). (Values enclosed in quotation marks are ASCII codes.):

- When ID is not specified:

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘50’ ‘53’ ‘4C’ ‘4F’ ‘43’ ‘4B’ ‘31’ ‘31’ ‘32’ ‘33’ ‘34’ ‘31’ ‘32’ ‘0D’ 00PSLOCK1123412↵		Command for enabling the password lock of DISPLAY INPUT (ID command is omitted.)
	‘30’ ‘30’ ‘50’ ‘53’ ‘4C’ ‘4F’ ‘43’ ‘4B’ ‘31’ ‘31’ ‘32’ ‘33’ ‘34’ ‘31’ ‘32’ ‘31’ ‘0D’ 00PSLOCK11234121↵	Response informing that the projector succeeded in enabling the password lock of DISPLAY INPUT (The statuses are echoed back as many as the number of the connected projectors.)

- When ID is specified (when the command is sent to the projector with the ID of “01” or “ALL”):

Command sent from the PC, etc.	Status code returned from the projector	Description
‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘50’ ‘53’ ‘4C’ ‘4F’ ‘43’ ‘4B’ ‘31’ ‘31’ ‘32’ ‘33’ ‘34’ ‘31’ ‘32’ ‘ 0D’ 00;01;PSLOCK1123412↵		Command for turning on the password lock of DISPLAY INPUT is sent to the projector with the ID of “01” or “ALL.”
	‘30’ ‘30’ ‘3B’ ‘30’ ‘31’ ‘3B’ ‘50’ ‘53’ ‘4C’ ‘4F’ ‘43’ ‘4B’ ‘31’ ‘31’ ‘32’ ‘33’ ‘34’ ‘31’ ‘32’ ‘31’ ‘0D’ 00;01;PSLOCK11234121↵	Response informing that the projector succeeded in enabling the password lock of DISPLAY INPUT (The status is echoed back from the projector with the ID of “01” or “ALL.”)